

October 27, 1994

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Mr. Donald F. Schnell
Senior Vice President - Nuclear
Union Electric Company
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SUBJECT: AMENDMENT NO. 93 TO FACILITY OPERATING LICENSE NO. NPF-30 -
CALLAWAY PLANT, UNIT 1 (TAC NO. M88770)

Dear Mr. Schnell:

The Commission has issued the enclosed Amendment No. 93 to Facility Operating License No. NPF-30 for the Callaway Plant, Unit 1. This amendment revises the Technical Specifications (TS) in response to your application dated February 10, 1994.

The amendment revises Technical Specification Table 2.2-1 and associated Bases Section 2.2.1. Table 2.2-1, Functional Unit 14, "Undervoltage - Reactor Coolant Pumps," is revised to correct Total Allowance (undervoltage relay span) and Allowable Value (voltage) expressions. Bases Section 2.2.1 is revised to clarify the relationship between the power supply and the undervoltage relays.

A copy of the Safety Evaluation is also enclosed. The notice of issuance will be included in the Commission's next biweekly Federal Register notice.

Sincerely,

Original signed by
L. Raynard Wharton

L. Raynard Wharton, Project Manager
Project Directorate III-3
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Docket No. 50-483

Enclosures: 1. Amendment No. 93 to
License No. NPF-30
2. Safety Evaluation

cc w/encls: See next page

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UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

October 27, 1994

Mr. Donald F. Schnell
Senior Vice President - Nuclear
Union Electric Company
Post Office Box 149
St. Louis, MO 63166

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CALLAWAY, UNIT 1 (TAC NO. M88770)

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Sincerely,

A handwritten signature in cursive script that reads "L. Raynard Wharton".

L. Raynard Wharton, Project Manager
Project Directorate III-3
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

Docket No. 50-483

Enclosures: 1. Amendment No. 93 to
License No. NPF-30
2. Safety Evaluation

cc w/encls: See next page

Mr. D. F. Schnell
Union Electric Company

Callaway Plant
Unit No. 1

cc:

Cermark Fletcher Associates
18225 Flower Hill Way #A
Gaithersburg, Maryland 20879-5334

Gerald Charnoff, Esq.
Thomas A. Baxter, Esq.
Shaw, Pittman, Potts & Trowbridge
2300 N. Street, N.W.
Washington, D.C. 20037

Mr. H. D. Bono
Supervising Engineer,
Site Licensing
Union Electric Company
Post Office Box 620
Fulton, Missouri 65251

U.S. Nuclear Regulatory Commission
Resident Inspectors Office
8201 NRC Road
Steedman, Missouri 65077-1302

Mr. Alan C. Passwater, Manager
Licensing and Fuels
Union Electric Company
Post Office Box 149
St. Louis, Missouri 63166

Manager - Electric Department
Missouri Public Service Commission
301 W. High
Post Office Box 360
Jefferson City, Missouri 65102

Regional Administrator
U.S. NRC, Region III
801 Warrenville Road
Lisle, Illinois 60523-4351

Mr. Ronald A. Kucera, Deputy
Director
Department of Natural Resources
P. O. Box 176
Jefferson City, Missouri 65102

Mr. Neil S. Carns
President and Chief
Executive Officer
Wolf Creek Nuclear Operating
Corporation
P. O. Box 411
Burlington, Kansas 66839

Mr. Dan I. Bolef, President
Kay Drey, Representative
Board of Directors Coalition
for the Environment
6267 Delmar Boulevard
University City, Missouri 65130



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

UNION ELECTRIC COMPANY

CALLAWAY PLANT, UNIT 1

DOCKET NO. 50-483

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 93
License No. NPF-30

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment filed by Union Electric Company (UE, the licensee) dated February 10, 1994, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. NPF-30 is hereby amended to read as follows:

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 93 , and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, are hereby incorporated into the license. UE shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of its date of issuance. The Technical Specifications are to be implemented within 30 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



L. Raynard Wharton, Project Manager
Project Directorate III-3
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical
Specifications

Date of issuance: October 27, 1994

ATTACHMENT TO LICENSE AMENDMENT NO. 93

OPERATING LICENSE NO. NPF-30

DOCKET NO. 50-483

Revise Appendix A Technical Specifications by removing the pages identified below and inserting the enclosed pages. The revised pages are identified by the captioned amendment number and contain vertical lines indicating the area of change. The corresponding overleaf pages, indicated by an asterisk, are also provided to maintain document completeness.

REMOVE

INSERT

2-5(b)

2-5(b)

2-5(c)*

2-5(c)*

B 2-7*

B 2-7*

B 2-7(a)

B 2-7(a)

TABLE 2.2-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

<u>FUNCTIONAL UNIT</u>	<u>TOTAL ALLOWANCE (TA)</u>	<u>Z</u>	<u>SENSOR ERROR (S)</u>	<u>TRIP SETPOINT</u>	<u>ALLOWABLE VALUE</u>
13. Steam Generator Water Level Low-Low (Continued)					
c. Vessel ΔT Equivalent > 20% RTP					
Coincident with					
Steam Generator Water Level Low-Low (Adverse Containment Environment) and Containment Pressure - Environmental Allowance Modifier	20.2	17.58	2.0	$\geq 20.2\%$ of Narrow Range Instrument Span	$\geq 18.4\%$ of Narrow Range Instrument Span
OR					
Steam Generator Water Level Low-Low (Normal Containment Environment)	14.8	12.18	2.0	$\geq 14.8\%$ of Narrow Range Instrument Span	$\geq 13.0\%$ of Narrow Range Instrument Span
14. Undervoltage - Reactor Coolant Pumps	33.3	1.33	0	≥ 10584 Volts A.C.	≥ 10105 Volts A.C.
15. Underfrequency - Reactor Coolant Pumps	3.3	0	0	≥ 57.2 Hz	≥ 57.1 Hz

TABLE 2.2-1 (Continued)
REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

<u>FUNCTIONAL UNIT</u>	<u>TOTAL ALLOWANCE (TA)</u>	<u>Z</u>	<u>SENSOR ERROR (S)</u>	<u>TRIP SETPOINT</u>	<u>ALLOWABLE VALUE</u>
16. Turbine Trip					
a. Low Fluid Oil Pressure	N.A.	N.A.	N.A.	≥ 598.94 psig	≥ 539.42 psig
b. Turbine Stop Valve Closure	N.A.	N.A.	N.A.	$\geq 1\%$ open	$\geq 1\%$ open
17. Safety Injection Input from ESF	N.A.	N.A.	N.A.	N.A.	N.A.

LIMITING SAFETY SYSTEM SETTINGS

BASES

Steam Generator Water Level

The Steam Generator Water Level Low-Low trip protects the reactor from loss of heat sink in the event of a sustained steam/feedwater flow mismatch resulting from loss of normal feedwater or a feedwater system pipe break, inside or outside of containment. This function also provides input to the steam generator level control system, therefore, the actuation logic must be able to withstand both an input failure to the control system (which may then require the protective function actuation) and a single failure in the remaining channels providing the protection function actuation. This results in a 2/4 actuation logic. With the transmitters (d/p cells) located inside containment and thus possibly experiencing adverse environmental conditions (due to a feedline break), the Environmental Allowance Modifier (EAM) was devised. The EAM function (Containment Pressure with a setpoint of ≤ 1.5 psig) senses the presence of adverse containment conditions (elevated pressure) and enables the Steam Generator Water Level - Low-Low trip setpoint (Adverse) which reflects the increased transmitter uncertainties due to this environment. The EAM allows the use of a lower Steam Generator Water Level - Low-Low trip setpoint (Normal) when these conditions are not present, thus allowing more margin to trip for normal operating conditions. The Trip Time Delay (TTD) creates additional operational margin when the plant needs it most, during early escalation to power, by allowing the operator time to recover level when the primary side load is sufficiently small to allow such action. The TTD is based on the continuous monitoring of primary side power through the use of Vessel ΔT . Two time delays are possible, based on the primary side power level, the magnitude of the trip delay decreasing with increasing power. In the event that the EAM or TTD functions do not meet the minimum channels operable requirements, it is acceptable to place the inoperable channels in the Tripped Condition and continue operation. Placing the inoperable channels in this mode will result in the enabling of the Steam Generator Water Level - Low-Low (Adverse) function, for the EAM, or in the removal of the trip delay, for the TTD. In the event that the Steam Generator Water Level - Low-Low (Normal) function does not meet the minimum channels operable requirement, it is acceptable to place the associated EAM channels in the Tripped Condition and continue operation. Performing this action will result in the enabling of the Steam Generator Water Level - Low-Low (Adverse) function which has a more conservative (higher level) trip setpoint. At this time it would also be acceptable to place the inoperable Steam Generator Water Level - Low-Low channels in the Bypassed Condition to prevent an inadvertent Reactor Trip or ESFAS actuation.

Undervoltage and Underfrequency - Reactor Coolant Pump Busses

The Undervoltage and Underfrequency Reactor Coolant Pump Bus trips provide core protection against DNB as a result of complete loss of forced coolant flow. The specified Setpoints assure a Reactor trip signal is generated before the Low Flow Trip Setpoint is reached. Time delays are incorporated in the Underfrequency and Undervoltage trips to prevent spurious Reactor trips from momentary electrical power transients. For undervoltage, the delay is set so that the time required

LIMITING SAFETY SYSTEM SETTINGS

BASES

Undervoltage and Underfrequency - Reactor Coolant Pump Busses (Continued)

for a signal to reach the Reactor trip breakers following the simultaneous trip of two or more reactor coolant pump bus circuit breakers shall not exceed 1.2 seconds. For underfrequency, the delay is set so that the time required for a signal to reach the Reactor trip breakers after the Underfrequency Trip Setpoint is reached shall not exceed 0.3 second. On decreasing power the Undervoltage and Underfrequency Reactor Coolant Pump Bus trips are automatically blocked by P-7 (a power level of approximately 10% of RATED THERMAL POWER with a turbine impulse chamber pressure at approximately 10% of full power equivalent); and on increasing power, reinstated automatically by P-7. The Total Allowance and Z values for the RCP Undervoltage trip function are based on percent of the undervoltage relay span while the Trip Setpoint and Allowable Value are based on voltages on the 13.8 kV, PA system busses powering the RCP motors. The undervoltage relay span is 30 volts, from 70 to 100 VAC. Potential transformers PA03 and PA06 have a ratio of 120:1 (14,400V to 120V); therefore, the Trip Setpoint of 10,584 VAC on the PA bus corresponds to 88.2 VAC at the undervoltage relay. Likewise, the Allowable Value of 10,105 VAC on the PA bus corresponds to 84.2 VAC at the undervoltage relay.

Turbine Trip

A turbine trip initiates a Reactor trip. On decreasing power the Reactor trip from the turbine trip is automatically blocked by P-9 (a power level of approximately 50% of RATED THERMAL POWER); and on increasing power, reinstated automatically by P-9.

Safety Injection Input from ESF

If a Reactor trip has not already been generated by the Reactor Trip System instrumentation, the ESF automatic actuation logic channels will initiate a Reactor trip upon any signal which initiates a Safety Injection. The ESF instrumentation channels which initiate a Safety Injection signal are shown in Table 3.3-3.



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 93 TO FACILITY OPERATING LICENSE NO. NPF-30

UNION ELECTRIC COMPANY

CALLAWAY PLANT, UNIT 1

DOCKET NO. 50-483

1.0 INTRODUCTION

By application for license amendment dated February 10, 1994, Union Electric Company (the licensee), requested changes to Technical Specification (TS) for Callaway Plant, Unit 1. The proposed amendment would revise Functional Unit 14 of Table 2.2.1, Undervoltage - Reactor Coolant Pumps, and the associated Bases. The revision corrects Total Allowance to reflect the measurement and test equipment (M&TE) uncertainty and the undervoltage relay voltage span. The Trip Setpoint and Allowable Value for Functional Unit 14 are expressed in terms of the bus voltages; and the Total Allowance, Z and S values are expressed in terms of percent undervoltage relay span (70 - 100 V). The Safety Analysis Limit (SAL) of 9384 Vac, the RCP trip setpoint of 10584 Vac, and the Z and S values will not be changed. The Bases change reflects the relationship between the 13.8 kV bus voltages and the 120 V undervoltage relays.

2.0 EVALUATION

The reactor coolant pumps (RCPs) receive power from the 13.8 kV buses. One potential transformer is connected in parallel with the 13.8 kV power supply to each RCP at the motor side of the supply breaker. The purpose of the transformer is to step down the 13.8 kV power supply to a 120 V power supply for an undervoltage relay, a time delay relay, and an underfrequency relay. The undervoltage relays provide signals to the solid state reactor protection system. The reactor will trip, when greater than 10% rated thermal power, if the voltage at one of two RCP motors in each of the two 13.8 kV buses decreases below the trip setpoint (10584 Vac). The time delay relay prevents spurious reactor trips caused by transient voltage fluctuations. The undervoltage trip is the primary trip function credited in the safety analysis for a complete loss of reactor coolant flow.

The Total Allowance is the difference between the nominal trip setpoint and the SAL. As discussed above, the nominal trip setpoint is 10584 Vac, and the SAL is 9384 Vac. The potential transformers for the undervoltage relays have a ratio of 14400:120. Converting the nominal trip setpoint and the SAL to the equivalent undervoltage relay voltages yields 88.2 V and 78.2 volts, respectively. In terms of percent span (70 - 100 V), this is 60.7% and 27.3%, respectively. Therefore, the difference between the Total Allowance and the SAL is 33.3%. The current Total Allowance as incorrectly stated in the TS is 7.7%. The staff finds that the proposed change to the Total Allowance value is appropriate and acceptable.

The revised Allowable Value is 10105 V, which is 84.2 V or 47.4% of the undervoltage relay span. The licensee stated that the M&TE accuracy for the Keithley 197 multimeter is ± 0.8 V for the 0 - 200 V range, which is the range that would be used for calibrating the undervoltage relays. The ± 0.8 V accuracy corresponds to $\pm 2.7\%$ of the 70 - 100 V undervoltage relay voltage span. The difference between the amended Allowable Value and the SAL is sufficient to account for M&TE uncertainties. Consequently, the staff finds that this proposed change is also appropriate and acceptable.

The staff also reviewed the proposed TS Bases regarding the relationship between the undervoltage relay span and the 13.8 kV power supply. The Bases change states that the Total Allowance and Z values for the RCP Undervoltage trip function are based on the percent of the undervoltage relay span, while the Trip Setpoint and the Allowable Value are based on the 13.8 kV buses that power the RCP motors. The licensee's discussion in the TS Bases addresses the voltage conversion ratio, voltage range, and resultant voltages. The staff finds these changes acceptable.

3.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Missouri State official was notified of the proposed issuance of the amendment. The State official had no comments.

4.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes surveillance requirements. The staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluent that may be released offsite and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that this amendment involves no significant hazards consideration and there has been no public comment on such finding (59 FR 14897). Accordingly, this amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of this amendment.

5.0 CONCLUSION

The staff has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: M. Waterman

Date: October 27, 1994